ORIGINAL RESEARCH PAPER
Volume - 15 | Issue - 01 | January - 2026 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

MANAGEMENT OF AN EXTENSIVE MANDIBULAR CEMENTO-OSSIFYING FIBROMA VIA SEGMENTAL MANDIBULECTOMY AND ILIAC CREST GRAFT: A CASE REPORT

Maxillofacial Surgery

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ABSTRACT

Fibro-osseous lesions (FOLs) are benign conditions characterized by replacement of normal bone by fibrous tissue containing varying amounts of mineralized material. Cemento-ossifying fibroma (COF) is a well-demarcated neoplasm commonly involving the jaws. This paper reports a case of cemento-ossifying fibroma of the mandible in a young male patient, highlighting its clinical, radiographic, histopathological features and management.

KEYWORDS

Cemento-ossifying fibroma, Fibro-osseous lesions, Mandible, Case report

INTRODUCTION

Fibro-osseous lesions (FOLs) are common benign growths found in the head and neck, characterized by spindle-shaped cells and varying amounts of woven bone. These lesions are classified into three types: fibrous dysplasia, cemento-ossifying fibroma (COF), and osseous dysplasia. COF, initially described by Menzel in 1872, was later reclassified by the World Health Organization (WHO) in 1992 into a single entity.

These lesions are typically well-demarcated neoplasms made of fibrous tissue, mineralized bone, or cementum-like material. While COFs primarily occur in the jaws, they pose a diagnostic challenge due to their variable clinical presentations. This report aims to explore the features and treatment options for COF.

CASE REPORT

A 21-year-old male presented with a painless swelling in the lower left posterior mandibular region for six months. Clinical examination revealed a well-defined, bony hard swelling measuring approximately 2 × 2 cm, obliterating the mucobuccal fold. Radiographic examination showed a well-defined radiopaque lesion involving the left mandible near the mental foramen. A provisional diagnosis of ossifying fibroma was made. Surgical resection was performed under general anesthesia followed by reconstruction using an iliac crest bone graft and reconstruction plate. Healing was uneventful.

Figure 1: Intra oral swelling in buccal vestibule

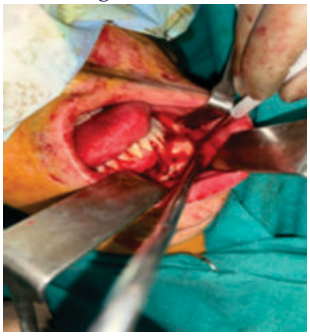

Figure 2: Degloving of mucoperiosteum with exposure of bony swelling

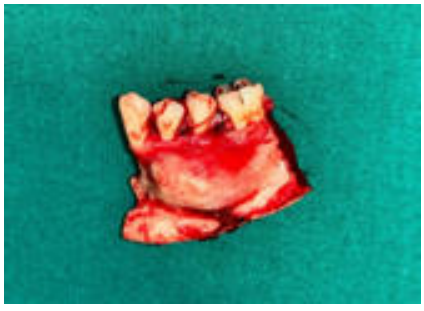

Figure 3: resected segment involving bony lesion

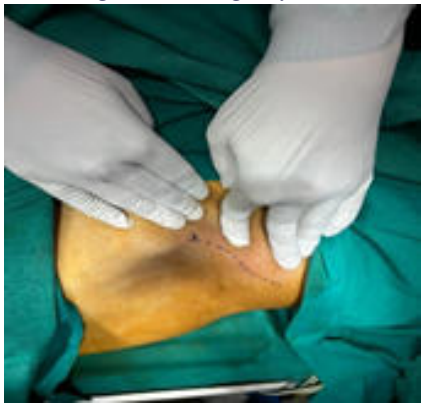

Figure 4: Iliac crest marking

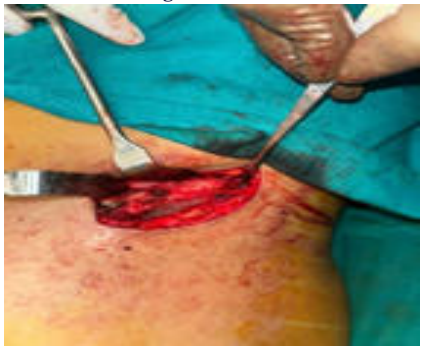

Figure 5: Exposure of iliac bone

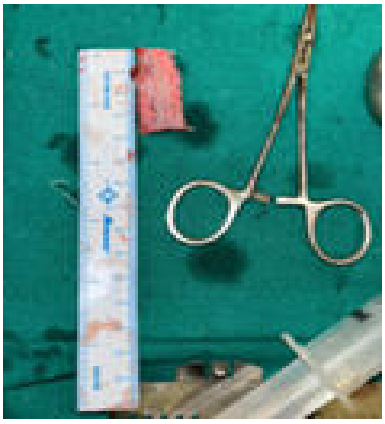

Figure 6: Harvested graft

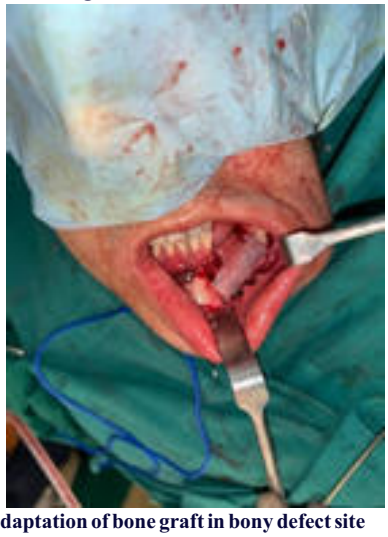

Figure 7: Adaptation of bone graft in bony defect site

Figure 8: Final fixation of graft and remanent bone

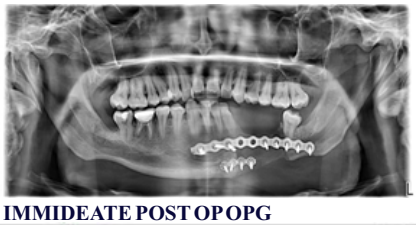

Figure 9: IMMIDEATE POST OP OPG

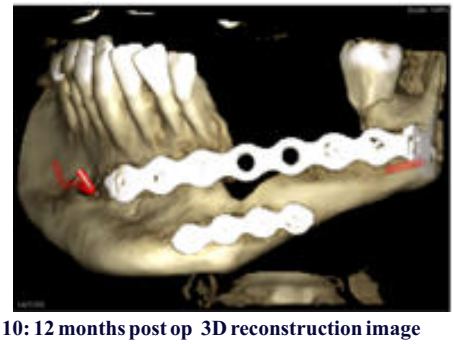

Figure 10: 12 months post op 3D reconstruction image

DISCUSSION

Ossifying fibroma (OF), along with fibrous dysplasia, is one of the most common fibro-osseous lesions in the maxillofacial region. These conditions, though distinct in their progression, share similar histomorphological and radiographic characteristics, complicating their classification and treatment. In 1992, the WHO placed both cementifying fibroma and ossifying fibroma (COF) under "osteogenic neoplasms" in the bone-related lesions category. While COFs are unique to the jaw, they should not be confused with ossifying fibromas in other skeletal areas. Other names for COF include cementifying fibroma and juvenile ossifying fibroma.

COFs are most commonly found in individuals between their second and fourth decades of life. There is some debate regarding sex predilection, with some studies suggesting a female preference, while others report a balanced gender distribution. A review of 75 cases by Su et al. found no significant sex bias overall, though a female predominance was noted in the fourth decade. COFs are more frequently observed in the mandible, particularly in the premolar-molar region, than in the maxilla.

COFs are thought to develop from mesenchymal blast cells in the periodontal ligament, which have the potential to differentiate into cementum, bone, fibrous tissue, or a combination of these elements. External factors, such as tooth extraction or trauma, may trigger the formation of COFs. The lesions can also arise from extraosseous sources, including ectopic periodontal membranes or embryonic cell nests. Clinically, COFs present as painless, slowly enlarging masses in the jaw, with tooth displacement often being the first noticeable symptom. Teeth adjacent to the lesion generally remain vital, and root resorption is uncommon, which can cause the lesion to go unnoticed until it results in visible facial deformity. The tumors typically remain well-defined and grow gradually until surgically removed.

Radiographically, COFs show varying patterns based on mineralization. In early stages, the lesion appears radiolucent with scattered calcific spots, which become more prominent as the lesion matures. Eventually, the lesion may turn completely radiopaque. Some studies indicate that younger patients typically show a more radiolucent pattern, while older individuals may exhibit a mixed radiolucent-radiopaque appearance. COFs are characterized by a centrifugal growth pattern, expanding symmetrically in all directions to form a well-circumscribed round mass. In some cases, additional radiographic signs, such as erosion of the mandible's inferior border or tooth displacement, may appear, although root resorption is rare, as seen in the current case.

Histologically, COF consists of hypercellular fibrous tissue interspersed with acellular areas. Mineralized components like woven bone, lamellar bone, and acellular basophilic deposits resembling cementum or osteoid material are scattered throughout the lesion. The cementum-like material is the reason COF is also called cementifying fibroma. However, cementum, which typically covers the tooth roots, is not clinically significant when found outside its usual location. The stroma of COF contains osteoid trabeculae and bone spherules that resemble cementum. The bone trabeculae in COF are primarily woven bone surrounded by mature lamellar bone with osteoblastic rimming at the edges. Cementum-like spherules have peripheral brush borders blending into the surrounding connective tissue.

Differential diagnosis of COF includes other fibro-osseous lesions, with fibrous dysplasia being the most common. Fibrous dysplasia, more frequently seen in the maxilla, grows longitudinally with poorly defined borders, unlike COF, which has a centrifugal, well-encapsulated growth pattern and is typically found in the mandible. Additionally, COF can be distinguished from Pindborg's tumor, which is commonly associated with impacted teeth.

Mandibular reconstruction poses challenges due to the complexity of the mandible and its importance in function and aesthetics. Effective reconstruction aims to restore skeletal and dental relationships, preserve aesthetics, and maintain function for speech, mastication, and swallowing. For smaller defects (<6 cm) or non-continuity defects that do not require soft tissue reconstruction, non-vascularized bone grafts (NVBG) are commonly used. These procedures offer faster recovery and are well-suited for dental implant reconstruction. The anterior and posterior iliac crest are popular donor sites due to their large bone supply and high concentration of osteocompetent cells.

Treatment for COF typically involves curettage or enucleation, as COFs are usually well-demarcated from the surrounding bone. However, in cases of aggressive lesions or recurrence, more radical resection and bone grafting may be required. A study by Eversole et al. found a 28% recurrence rate among patients treated with curettage or enucleation. Similarly, Slootweg and Muller reported similar recurrence rates for both conservative and extensive surgeries. In the present case, the tumor was large enough to necessitate surgical resection followed by bone grafting.

CONCLUSIONS

Cemento-ossifying fibroma is a rare benign tumor with a predilection for the mandibular region. Accurate diagnosis requires correlation of clinical, radiographic, and histopathological findings. Surgical management is the treatment of choice, and long-term follow-up is essential due to the risk of recurrence.

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